DOCUMENT RESUME

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IDENTIFIERS	Elementary Secondary Education Act Title III; ESEA Title III

ABSTRACT

A local evaluation report and an information packet describing activities developed under this mini-grant deal with a supplemental art curriculum on glass work. Over a four month period, a glass workshop was planned to emphasize the creative possibilities of glass and information packets were developed to train teachers to conduct classroom art projects using glass. The evaluation report presents statistical information, a project description, project activities, a narrative report and written evaluations. The information packet explains the use of the kiln in firing the glass and describes fifteen projects or techniques using glass or plexiglass. The materials needed, procedures, and suggested grade level are indicated for each technique. Some of the projects include glass collage; fusing glass into glass blanks; fracturing; frosting; glass staining; stained glasswindow; polymosaic tile; and broken glass mosaic. Evaluations of the project are favorable. Most participating teachers indicate plans to include glass in their future art programs. (Author/KSM)

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INNOVATIVE & EXEMPLARY

ESEA III

NEBRASKA

Local Evaluation Report

FISCAL YEAR 1973

SP 006 851

NEBRASKA
ESEA Title III
Local Evaluation Report
FY 1973
(Submit 3 copies by August 15)

Name of Project Supplementing Art Curriculum, Date submitted May 7, 1973

Applicant Agency Educational Service Unit #9

Person completing this report Karen Kohtz, Project Director

SECTION I - STATISTICAL INFORMATION

1) Number of other school districts replicating your Title III project during fiscal year:

N.A. This was a short term project that was just completed.

2) What methods are being used to determine the extent your project is being adopted or adapted by other schools? (Comments)

Through correspondence and visitations to the schools in the area we will be able to determine what schools will be adapting our project.

3) Below are listed the state's critical educational needs as identified in the State Plan. Indicate which need your Title III project is primarily designed to demonstrate a solution to.

State's Critical Needs (a)	Check if your project is in the need area (b)	Amount Granted During Fiscal Year (c)
1) Programs for exceptional children		$
2) Training for teachers of the exceptional		$
3) Assess and develop each child's potential		$
4) Develop self-motivation and self-direction		$
5) Develop positive feelings in children		$
6) Continuous educational progress for children	XXXX	$2,500
7) Involve the community in educational planning		$
8) Training for staff who work under abnormal conditions		$
9) Training for local boards of education		$

If your active projects are not in the needs areas, explain why (if additional sheets are needed, identify as Section I, 3)

4) Indicate which of the areas of national concern your project fits into. (Figures should be unduplicated)

Programs (a)	Single Component (b)	Multiple Component (c)	Estimate Number of Students Served (d)	Amount Granted for Fiscal Year (e)
Reading				$
Environment/Ecology				$
Equal Educational Opportunity				$
Model Cities (Urban, Inner-City)				$
Gifted				$
Handicapped				$
Guidance and Counseling				$
Drug Education				$
Early Childhood Education				$
Other Programs	XX		535	$ 2,500

5) NUMBER OF STUDENTS SERVED BY TARGET POPULATIONS (Figures may be duplicated)

Students (a)	Projects for Indians (b)	Projects for Migrants (c)	Projects for Disadvantaged (d)
Number of students			

Students	Projects for Handicapped (e)	Projects for Pre-K through Grade 3 (f)	Projects for Other Target Populations (Specify) (g)
Number of students			535, cross section of students

6) VISITATIONS TO YOUR PROJECTS

A. Number of persons visiting on-site 600

B. Number of school systems represented 11

7) NUMBER OF PUBLIC AND NONPUBLIC SCHOOL STUDENTS, TEACHERS, AND COUNSELORS PARTICIPATING

DIRECT PARTICIPATION

Schools (a)	STUDENTS		TEACHERS		COUNSELORS	
	Elementary (b)	Secondary (c)	Elementary (d)	Secondary (e)	Elementary (f)	Secondary (g)
Public	310	160	15	5		
Nonpublic		65	0	2		

INDIRECT PARTICIPATION

Schools	STUDENTS		TEACHERS		COUNSELORS	
	Elementary (h)	Secondary (i)	Elementary (j)	Secondary (k)	Elementary (l)	Secondary (m)
Public	90			3		
Nonpublic						

8) RURAL/URBAN DISTRIBUTION OF PUBLIC AND NONPUBLIC STUDENTS IN DIRECT PARTICIPATION

a. Number of students from rural areas. 40

b. Number of students from urban areas. 495

c. Total (Equals number reported Section 7 columns (b) and (c)). 535

9) LOCAL DISSEMINATION ACTIVITIES (a)	NUMBER OF PERSONS REACHED	RANK IN ORDER OF IMPORTANCE (b)	MAINLY FOR PUBLIC (Number) (c)	MAINLY FOR EDUCATORS (Number) (d)	EQUALLY FOR BOTH (Number) (e)
Conferences, Workshops on Projects	602	1	1	3	
T.V. Programs					
Radio Programs		4			
Publications Distributed	100		20	1	
Dissemination Studies Conducted					
Articles Printed in Journals and Newspapers	500	2	5	3	
On-site Demonstrations Conducted	602	3		2	
Demonstration Conferences	20			2	
Visits Arranged	20			20	
Films and Filmstrips Produced 81 idea			2	3	
Personnel Interchanges					
Project Personnel Trained for Dissemination by State (Sessions of more than one day)					
Other (Specify)					

SECTION II - PROJECT DESCRIPTION

Project Abstracts (ESEA, Title III)	Date	Total Project Period	From(Month & Year)	To (Month & Year	Project Number
	May 7, 1973		Jan. 1, 1973	June 1, 1973	72-334

Title of Project	Grantee Name & Address
Supplementing Art Curriculum	Educational Service Unit #9 P.O. Box 856 Hastings, Nebraska 68901

Projected Funding Level For Project Period	1970	1971	1972	1973	1974	1975
	$	$	$	$ 2,500	$	$

Primary Target Population	Number Served
General Cross Section	545

PARAGRAPH DESCRIPTION

Through Title III, E.S.U. #9 provided a new art experience for area students. Because of the diversity of art, teachers are unable to provide experiences in all areas of art.

A survey indicated students have not worked with glass, or plexiglass. A three day glass workshop was organized to emphasize the creative possibilities of glass. After an hour at the workshop students were given the opportunity to work with glass in the classroom.

Information packets were developed to accompany classroom glass projects.

MAJOR OBJECTIVES

1. Give students the opportunity to create with glass.
2. Help students to realize the creative possibilities of glass.
3. Teachers will gain knowledge in the creative possibilities of glass.
4. This knowledge will enable teachers to include glass in their art programs.

ACTIVITIES TO ACHIEVE OBJECTIVES

Two activities were planned to achieve the objectives.

1. Glass workshop was planned to emphasize the creative possibilities of glass.
2. Information packets were developed to train the teachers so they can conduct art projects in the classroom using glass.

EVALUATION STRATEGY

Teachers who were directly involved in the project served as evaluators and teachers not directly involved also were invited to evaluate the project.

EVALUATION FINDINGS

Evaluations of the project were favorable. Many of the teachers preferred to work directly with glass instead of substituting a similar material such as plastic. A majority of the teachers preferred glass to plexiglas. Student response to the workshop was termendous. Even the younger students remained attentive during the entire hour of the workshop.

Most of the teachers plan to include glass in their art programs next year.

SECTION III - PROJECT ACTIVITIES

A. HANDICAPPED PROJECT PARTICIPATION ONLY - ESEA TITLE III NOTE: *(List the project number of each of your projects involving the handicapped, in this space, and furnish the information for all the projects, in the table below)*

1. HANDICAPPED CHILDREN SERVED, PERSONNEL PAID, AND IN-SERVICE TRAINING RECEIVED WITH ESEA TITLE III FUNDS

TYPE OF HANDICAPPED CHILDREN SERVED *	NUMBER OF CHILDREN SERVED					FULL-TIME EQUIVALENCE OF PROJECT PERSONNEL PAID WITH TITLE III FUNDS				PERSONNEL RECEIVING IN-SERVICE TRAINING WITH TITLE III FUNDS			
	0-5 YEARS	6-12 YEARS	13-18 YEARS	19 & OVER	TOTAL	TEACHERS	TEACHER AIDES	OTHER	TOTAL	TEACHERS	TEACHER AIDES	OTHER	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
(1) TMR													
(2) EMR													
(3) LD													
(4) ED													
(5) OHH													
(6) CR													
(7) VH													
(8) D-B													
(9) HOH													
(10) SH													
(11) SI													
(12) TOTAL													

2. NUMBER OF HANDICAPPED CHILDREN SERVED WHO ATTEND NON-PUBLIC SCHOOLS

3. DISTRIBUTION BY ETHNIC GROUPS

POPULATION	NEGRO	INDIAN	ORIENTAL	SPANISH SURNAME	WHITE (Other than Spanish surname)	OTHER	TOTAL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Student Participants							

4. CHILDREN RECEIVING SERVICES - DISTRIBUTION BY DEMOGRAPHIC AREA

CATEGORY	NUMBER
(1) Urban Areas *(over 50,000)*	
(2) Rural Areas *(under 2,500)*	
(3) Other Demographic Areas *(from 2,500-50,000)*	
(4) **TOTAL** *(Sum of lines (1), (2), and (3))*	

INSTRUCTIONS

1. **CHILDREN SERVED** – Enter in the appropriate columns b, c, d, and e an unduplicated count of children served by type of primary handicap *(in public and non-public schools)* and by age group who received direct instructional or related services with Title III funds. This count should include all handicapped children *(1)* who received direct services from personnel paid with Title III funds and/or *(2)* who received substantial benefit as a result of the purchase or projects equipment or the provision of significant in-service training of personnel with Title III funds. Do not include handicapped children who received only incidental services, such as preliminary vision screening or audiological testing, etc. Column f should equal columns b, c, d, and e.

   PROJECT PERSONNEL – Enter in the appropriate columns g, h, and i corresponding with the primary type of handicapped children served a figure representing an unduplicated count of the full-time personnel plus the full-time equivalency of part-time personnel paid from Title III funds. Full-time personnel are those personnel who were assigned to Title III project activities 40 hours or more per week *(or the number of hours in a regular work week, as determined by the State or local education agency)*. They may be school year, summer program, or 12-month personnel. Column j should equal columns g, h, and i.

   IN-SERVICE TRAINING – Enter in the appropriate columns k, l, and m corresponding with primary type of handicapped children served an unduplicated count of all personnel who receive in-service training with Title III funds. Column n should equal columns k, l, and m.

2. **NON-PUBLIC SCHOOLS** – Of the total number of handicapped children served with Title III funds *(1)(12), (f)*, indicate the number who attended non-public schools.

3. **DISTRIBUTION BY ETHNIC GROUPS** – Enter in the appropriate columns b, c, d, e, f, and g an unduplicated count of the handicapped children served with Title III funds by ethnic group membership. Column h should equal columns b, c, d, e, f, and g.

4. **DISTRIBUTION BY DEMOGRAPHIC AREAS** – Self-explanatory.

* **TMR** - Trainable Mentally Retarded; **EMR** - Educable Mentally Retarded; **LD** - Learning Disabled; **ED** - Emotionally Disturbed; **OHH** - Other Health Impaired; **CR** - Crippled; **VH** - Visually Handicapped; **D-B** - Deaf-Blind; **HH** - Hard of Hearing; **SI** - Speech Impaired

SECTION IV - NARRATIVE

A. Describe your most successful dissemination activities undertaken for each of the following three stages of the adoption process:

1. To create awareness of your project's progress and outcomes. (The audience is expressed to the innovation, but lacks complete information about it.)

    a. Public in general.

    b. Educators.

2. To stimulate and create an active interest in your project's outcome. (The audience becomes interested in the new idea and seeks additional information about it.)

3. To provide personal opportunities for evaluation of your projects outcome by potential adopters. (The audience mentally applies the innovation to his present situation and future anticipated stituation.)

B. Submit two copies of your outside evaluator's and auditor's final report for FY '73.

C. Prepare an annotated bibliography on instructional or curriculum materials produced by your project, and submit two copies of each of the materials.

D. Prepare a listing for each film or audiovisual presentation developed for the project this year. (Follow the example given below:)

Title: A Brighter Future

Project No.: 71-310 Media: Slide-Tape Color

Time: 15 minutes

Abstract: Describes the Alliance Community Guidance Project for Indian youngsters. Participants are given experiences they do not received at home or school, and have access to special tutoring, counseling, and a learning center.

William Podraza, Director, Community Guidance Project,
100 West 14th Street, Alliance, Nebraska 69301
(308) 762-5475

E. Describe specific administrative problems, if any, which could be eased by Federal or State administrative action. Make specific recommendations.

F. What do you consider to be the major contributions of your Title III project to education in Nebraska. Cite examples and evidence.

G. Describe your Community Council's activities for the fiscal year. Include the number of meetings, hearings, conferences, onsite project visitations, and evaluation and dissemination activities.

H. What is your Community Council's evaluation of the overall effectiveness of your Title III project. Please attach a statement from the Community Council Chairman?

I. What recommendations would you make to either United States Office of Education or the Department of Education toward improving the effectiveness of the Title III program?

NARRATIVE

A.

Several activities were undertaken to inform the public of our projects' progress and outcome. Upon receiving the mini-grant a local redio station announced E.S.U. #9 as the recipient of an E.S.E.A. Title III Mini Grant. A brief description of the project's objectives and activities were included in the announcement. The local newspaper also ran a story on E.S.U. #9 as a recipient of an art mini grant. They also included a description of the project and its activities.

E.S.U. #9 prints a newspaper which is mailed to approximately 500 people. Three issues of this paper contained articles on E.S.U. #9's Title III art mini-grant . The first article explained the objectives of the project. The two remaining issues carried reports on the progress of the mini grant.

Educators were informed about the mini grant through correspondence.

The most important activity undertaken to stimulate an interest in the outcome of this project involved inviting the public to the glass workshop. Invitations were issued by letter, through the newspaper, and by radio stations.

Activities which informed the public about the outcome of the project included displays of the art projects made from glass at Open House, displays in the halls and libraries of the participating schools. Each child participating in this Title III project will be taking home an art project to show their parents what they have created using glass.

Potential adaptors of this project are art teachers in the E.S.U. #9 area and throughout the state of Nebraska. Copies of the information developed for this project were mailed to all art educators in the E.S.U. #9 area. They can read and evaluate this material to determine its practicality for their art program. Art educators were also invited to attend the Glass workshop.

B.

An outside evaluator's report has been attached to this Narrative.

An Auditor's report is not available at this time. E.S.U. #9 is audited by the State of Nebraska. We have not been audited yet this year and have no knowledge of when we will be audited. Whenever an auditor's report is available we will forward it to the Title III Office in Lincoln.

C. Annotated Bibliography

Claus, Jean; Karen Kohtz, Roger Patterson, and Becky Pitman.
Glass, 1973, printed at E.S.U. #9, Hastings, Nebraska.
This booklet includes the projects that were developed through funds from E.S.E.A. Title III. The projects were developed through experimentation and research.

D.

Title: Glass (As creative media)
Project No: 73-334
Media: Slides and Narrative
Time: 10 minutes
Abstract: Shows two glassblowers at work and many of the items they

have created. The slides also show examples of projects elementary and secondary students completed using glass.

Karen Echtz, Director
Supplementing Art Curriculum
Educational Service Unit #9
P.O. Box 856
Hastings, Nebraska 68901
463-9390

E.

There were no administrative problems related to this project which could have been eased by State or Federal Action.

F.

Glass as a creative media is growing in popularity. Off-hand glassblowing is being revived and taught in several colleges and universities across the nation.

This project gave area E.S.U. #9 students the opportunity to observe off hand glassblowing, and creative glassblowing using laboratory glass. Presenting these two demonstrations at the same workshop gave students and the public the opportunity to compare and contrast these two methods of glassblowing.

A demonstration of off hand glassblowing is an activity which very few Nebraska students have the opportunity to see.

Through this project glass has been introduced into the classroom as a creative media. Many of the teachers involved in the project stated that without Title III funding and E.S.U. #9 's assistance in researching and developing these projects, glass would not have been introduced into the classroom at this time.

G-H.

This project was a short term activity which only lasted four months. Community Council envolvement in this project was impractical, however we did allow for public involvement through invitations to the glass workshop.

TYPE WRITTEN EVALUATION ATTACHED.

ESEA TITLE III

GLASS WORKSHOP

EVALUATION

Your reaction to the workshop: We personally feel that this was one of the finest workshops we have attended in the field of art. My wife & I feel that it is of the upmost importance to have an authority demonstrate & explain the various techniques in which ever area is being covered such was the case in this workshop held on glass-blowing.

(I hope that in the future more workshops of this caliber can be held.)

Evaluation of Glass Projects:

Excellent - (a very excellent presentation and explanation)

Other Comments: Would you attempt any of these projects in your classroom?

Yes - the material prepared could be used or applied to most school systems and is very commendable.

Raymond L. Haggstrom
Senior High Art Instructor

Pauline L. Haggstrom
Junior high and Elementary Art Instructor

Please complete and return by May 11, 1973.

Aurora Public School System

ESEA TITLE III

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EVALUATION

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Please complete and return by May 11, 1973.

Aurora Public School System

Raymond L. Haggstrom
Senior High Art Instructor

Kandis L. Haggstrom
Junior High and Elementary Art
Instructor

Evaluation by teachers involved in the Project

Longfellow

ESEA TITLE III

GLASS WORKSHOP

EVALUATION

Student reaction to workshop:

"Neat", "Interesting", "Gee whiz, I'd like to learn how to do that.", "Can we stay longer?" "I'd like to have a piece at home." Fascinating. In general, they were very impressed. Many were surprised at the plasticity of hot glass. Some made scientific observations, i.e. Centigrade is hotter than Farenheit.

Evaluation of Glass Projects:

Longfellow 6th graders made an impressive array of projects from our supplies. Many came up with projects and ideas and combinations that showed originality and thought. Others experimented widely.

Other Comments:

The glass blowers did an excellent job of explaining their work.

This came at a good time of the year when students get "senior-itis"; and need something different.

We had enough materials that 5th graders also got to participate on a small scale.

We plan to integrate Paky-Mosaic tile work into our curriculum as a regular project (on a limited budget, projects will have to be small).

Please complete and return by May 11, 1973.

(Over)

ESEA TITLE III

GLASS WORKSHOP

EVALUATION

STUDENT REACTION TO WORKSHOP:

"Neat", "Interesting", "Some day I'd like to learn how to do that." "Can't we stay longer?" "I'd like to have a piece at home." "Fascinating"

In general, they were very impressed. Many were surprised at the plasticity fo hat glass. Some made scientific observations, e.g. Centigrade is hotter than Farenheit.

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This came at a good time of the year when students get "senior-itis" and need something different.

We had enough materials that 5th graders also got to participate on a small scale.

We plan to integrate Poly-Mosaic tile work into our curriculum as a regular project (On a limited budget, projects will have to be small).

Longfellow
Hastings, Nebraska

ESEA TITLE III

GLASS WORKSHOP

EVALUATION

Hawthorne Elem
Hastings

Student reaction to workshop:

From a parent and fellow teachers voluntary comments were that the sixth graders enjoyed the workshop. The students gave very good attention to both demonstrations and asked questions.

One student asked if he could go again the next day. Very few if any had seen glass blowing from molten glass.

Evaluation of Glass Projects:

Enthusiasm for the projects varied, of course. They especially liked experimenting with melting though our equipment for this was very limited. Some did some of it at home and brought back the plastic tiles to finish. The boys liked making 3-d crosses.

Some, at present are doing good work in making mosaics with the glass, cathedral and crushed.

More interest in the little coasters was shown than I anticipated. They required 16 tiles and were quickly done.

Other Comments:

It would be very good to do this project another year. More varieties of expression are possible. I'm sure there will be a number of fifth graders who will ask if glass projects are a part of the program for Grade 6. Because of the shortage of cathedral glass the project, so far, has been limited to the sixth grade.

Please complete and return by May 11, 1973.

The display window received lots of attention from sixth graders and teachers made favorable comments.

ESEA TITLE III

GLASS WORKSHOP

EVALUATION

Student reaction to workshop:

From a parent and fellow teachers voluntary comments were that the sixth graders enjoyed the workshop. The students gave very good attention to both demonstrations and asked questions.

One student asked if he could go again the next day. Very few if any had seen glass blowing from furnace or kiln molten glass.

Evaluation of Glass Projects:

Enthusiasm for the projects varied, of course. They especially liked experimenting with melting though our equipment for this was very limited. Some did some of it at home and brought back the plastic tiles to finish. The boys liked making 3-D crosses.

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Hawthorne Elementary
Hastings, Nebraska

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Glass

E.S.E.A.
Title III

Following Material Presented by:

Jean Claus

Karen Kohtz

Roger Patterson

Becky Pitman

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FIRING GLASS

1. Prepare kiln shelves or molds with a coat of kiln wash. Only a thin layer is needed. (If wet separators are used, allow shelves or molds to become completely dry before firing).

2. Arrange glass fragments, cut-outs, or blanks. Large pieces should not be closer than 1½ inches to kiln elements. Unless fusion is desired, fragments should not be touching.

3. Prop kiln lid open about an inch and remove plug. Turn on low heat for about an half hour.

4. Turn heat to medium for an half hour.

5. Turn heat on high. When temperature has reached 1000°F., or interior chamber is dull red, replace plug and close lid.

6. From time to time, peek inside to observe the progress of the glass. When it has reached the desired state of viscosity, turn heat off and immediately fan the lid several times. This will permit the escape of latent heat which would cause the melting process to continue past the ideal stage.

7. CLOSE LID AND DO NOT OPEN UNTIL KILN IS COLD.

8. Cone 016 is the approximate range of most glass.

FUSED GLASS PROJECTS

1. GLASS PANEL FROM CRUSHED GLASS

Materials:

Colored bottles
Cathedral glass
Aluminium foil
Newspapers
Hammer
Several pint jars
Gloves
Plastic spoons

Procedure:

Preparing the glass

Wrap bottles and other glass in aluminium foil.

Heat to 400 degrees in kiln or oven

Immerse in cold water (This will shatter the glass)

Place glass between newspaper and crush with a hammer

Spoon crushed glass from foil into jars.

Making the Panel

Prepare kiln shelf with seperator.

Lightly draw design on kiln shelf.

Spoon glass on shelf approximately 1/4 inch thick

The entire area should be covered

Fire to Cone 016 or according to the instructions on page 1

2. FIRING BOTTLES

Materials:

Bottles (only one brand of bottle can be fired at a time because of the different melting points each brand has)

Metal rod or strip

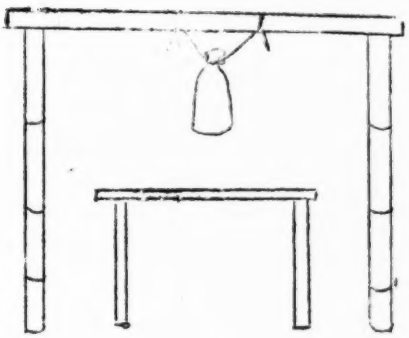
Wire

Procedures:

Place heavy metal strip across the top of the kiln.

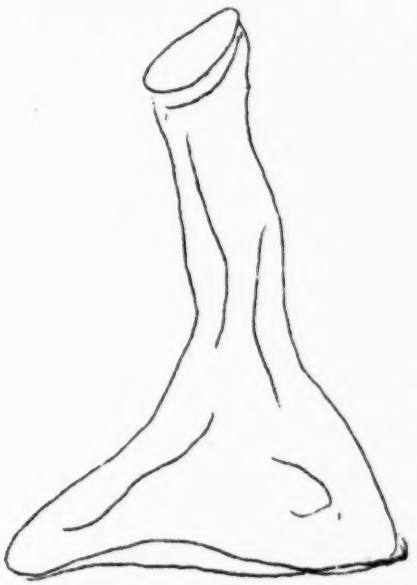
Wire the bottles to the heavy metal strip. Bottle must be wired with two wires (as illustrated below).

If you do not want the bottle to stretch the entire length of the kiln, put a shelf in.



Fire according to instructions on page 1. Bottles must be watched closely.

WHEN FIRING IS COMPLETED, FAN THE LID, CLOSE THE LID AND KEEP IT CLOSED UNTIL THE KILN IS COMPLETELY COOL.



GLASS COLIAGE

Materials:

Cathedral Glass
Glass Cutters

Procedure:

Cut glass into desired shapes.

Arrange shapes on kiln shelf, overlaping many of the pieces

Fire to cone 016

Pieces should fuse together

Glass should be mounted to a sturdy background with glue, or heavy nylon fishing cord.

FUSING GLASS INTO GLASS BLANKS

Materials:

Cathedral Glass
Glass Cutter

Procedure:

Cut a large piece of glass which will be used for the background.

Cut smaller pieces and arrange them on the background to form a composition.

Place on kiln shelf and fire to cone 016.

WHEN FIRING IS COMPLETE, FAN LID, CLOSE IT AND KEEP IT CLOSED UNTIL THE KILN IS COMPLETELY COOL.

Variation: Wire can also be fused into glass. Place wire under the glass blank.

GLASS CLINIC

This is a list of questions most frequently asked and the answers to them. For the most part, indifferent results in bending glass can be attributed to a lack of understanding of the techniques used in firing. The most outstanding craftsmanship in decorating glass can be completely nullified by overfiring or underfiring. I sincerely hope that the following definitions will serve as guides to those experimenting with the fusion of glass for the first time.

1. HEIGHT OF SHELF ABOVE - Although cone or pyrometer readings may indicate correct kiln temperature, a shelf positioned directly over the mold and blank deflects additional heat. Always set an upper shelf at least four inches above the top of the glass blank.

FRACTURING

1. TOO RAPID HEATING OF THE KILN - Usually occurs in the 500° F. to 700° F. range. Remedy: slower rise in temperature, as indicated in 1. Balloons (above).

2. TOO SUDDEN COOLING - Usually occurs in the 850° F. down to 500° F. range. It is the nature of glass to expand under heat and to contract while cooling, and neither process can be hurried.

3. IRREGULARITIES IN CUTTING THE GLASS BLANK OFTEN START AN INVISIBLE FRACTURE WHICH DEVELOPS DURING THE FIRING - Check the edges of the blank for minute score lines deviating from the general shape.

4. LAMINATION - Two or more different thicknesses of glass. Varying thicknesses (or different brands of glass of equal thickness) expand and contract differently. Always use the same brand and thickness of glass for lamination. If possible, cut both blanks from the same sheet of glass.

FROSTING OR DISCOLORATION

1. CONDENSATION - Moisture in the kiln condenses, affecting the gloss of the blank. Always dry applied colorants before firing, and check the condition of mold separators. Dry separators can absorb moisture from the air during damp weather. If the separator is dense, heavy, or difficult to sift, dry the mold before firing. Separators in liquid form give off steam if fired immediately. Always dry the mold 24 to 36 hours in a warm room, if the separator is sprayed or painted on the mold.

2. INTRODUCTION OF COMBUSTIBLE MATERIAL. Plastics, sequins, cereals, etc., burn out, giving off fumes. Use only materials that are designed for firing.

3. STAINED GLASS. Certain brands and colors of stained glass contain ingredients which undergo chemical change in firing.

STAINED GLASS PROJECTS

Project - Glass Staining
Grade Level - 7-12

Materials: glass stain paints
thinner
lead tape
lead adhesive
glass panel
brushes
rubbing alcohol

Process:

1. Make a sketch
   A design pattern should be made on paper the actual size of the glass to be decorated. The lines should be kept simple and crisp. The stain will cover better if the design contains many small areas instead of larger ones.

2. Prepare the lead
   Straighten out lead tape on a hard surface. Brush a thin coat of adhesive along the entire lead surface and permit to dry thoroughly (approximately 10-15 minutes). Adhesive-coated lead can be stored two - three weeks, if kept clean and dry.

3. Clean glass and attach pattern
   Thoroughly clean the glass surface by wiping it with rubbing alcohol. This assures proper lead and stain adhesion. Fasten the sketch to the bottom of the glass with tape.

4. Strip lead and apply.
   Reel strips of lead as needed to cover the outlines of the sketch. Split 1/8 inch to narrower widths for fine detail. Cut lead to fit as closely and tightly as possible in joints. Press adhesive coated side of lead firmly onto the glass. Complete contact will prevent colors from bleeding and running into each other. Small circles and curves can be formed of uncoated lead and adhesive applied after the shape is finished. If lead will not adhere securely, the glass may be dirty, moist or fingerprinted and should be cleaned again. Excessive adhesive can be removed with thinner.

5. Painting the glass

Position the glass panel about 1/2 inch above a white surface, or work over a light source, for a clear indication of color intensity. Keep the work level so that paint will flow on the glass evenly. Flow the paint on liberally, helping the spreading action with the application brush. The more paint used, the deeper the color. Clean the brush thoroughly with thinner before using it for the next color. If color bleeds into an adjoining leaded area, permit it to dry. Scrape away this seepage before painting the area. You can also apply stain with a toothpick, plastic squeeze bottle (don't store paint in bottle because it may dissolve) or copper screening used as a comb.

6. Special effects

Blow through a straw to create the rippled effect of cathedral. Apply a darker color over a lighter color. Drop a small amount of second color on a wet coat of glass stain. Apply glass stain to both sides of glass.

Project - Stained Glass Window
Grade Level - 10-12

Materials: Cathedral glass
lead came
duco - cement
soldering iron
solder
glass cutter
kerosene

Process:

1. Make a sketch

A design sketch should be made on paper the size the window will be. Simple shapes should be used to make up the design.

2. Cut the glass

Using a glass cutter held vertically, score the glass, then fracture it by tapping with the ball end of the glass cutter, along the underneath side of the cut. Sometimes it is necessary to break the glass by hand by holding the glass firmly and gently bending it downward. Before scoring the glass, dip cutter into kerosene to lubricate the wheel bearing.

3. Apply the lead came

Straighten out the lead came and separate the sides. Apply duco-cement along the inside of the section of lead came to be adhered. Attach the lead came to the glass and bend the sides securely against the glass. Allow to dry and continue process until several sections have been attached together.

4. Soldering

Solder the joints where the lead came is attached. Small pieces of lead can be soldered where crevices occur.

STAINED GLASS

3.

Materials:

Cathedral Glass
Glass panel
Duco cement
Glass cutter
Plastic aluminium or Model Metal
Model metal thinner
Finger nail polish remover
Razor blade

Procedure:

Clean glass panel with any window cleaning solvent.
Cut Cathedral glass into desired shapes.
Glue each shape to the glass panel, leaving a space between each piece of glass.
Squeeze plastic aluminium into space between pieces of Cathedral glass.
Scrape excess off with a razor blade.
Wipe excess metal from Cathedral glass with a cloth. If necessary, use fingernail polish remover to remove plastic aluminium which may have hardened on Cathedral glass.
Allow plastic aluminium (or Model Metal) to dry overnight. Fill in areas that have shrunk away while drying.
Again remove excess metal and allow to dry.

MOSAICS

#1. Polymosaic Tile Mosaic

Materials:

Tile Cutter
Felt tip pen
Polymosaic tile
Soldering gun with tile cutting tip
Pizza pan or cookie sheet
Ducco cement
Poster board
Oven or kiln (hot plate)

1. Make a sketch of mosaic so you may determine the shape of your pieces.
2. Lay several tiles, of the same color side by side on a cookie sheet and place them in an oven or kiln until they fuse together. (This may also be done on a hot plate) 350°, 10-15 minutes. Let cool.
3. On these fused tiles, draw your shape with a felt tip pen.
4. Carefully cut out this shape using the soldering gun and tile cutting tip.
5. Glue to the poster board in the appropriate position.
6. Repeat until all shapes have been fused, cut, and glued.

Caution:

Some ventilation is needed due to the fumes given off during the cutting and melting of the plastic.

#2. Polymosaic ornament (elementary)

Materials:

Poster board
Ducco cement
Polymosaic tiles
Yarn

1. Determine your design
2. Arrange the polymosaic tiles in this design on the poster board.
3. Glue the tiles.
4. Cut out the cardboard shape.
5. Insert the yarn -
   yarn may be braided, possibly macramed
6. Back of the ornament might be finished off by arranging and gluing tiles, in the same manner as the front or painting with acrylic paint.

#3. Polymosaic Geometric Design

Materials:

Poster board
Ducco cement
Polymosaic tiles
Tile grout (Red Devil Brand - Allen's - 79¢ per tube)

1. Plan a design with the tiles - possibly in connection with a study of Indian Designs
2. Arrange the tiles in this design on poster board
3. Glue the tiles - let dry
4. Apply grout with the fingers, pressing it into the cracks of the tiles
5. Let dry 30 minutes - Wipe off excess with a damp cloth

#4. Broken glass and Crushed glass Mosaic

Materials:

Plywood or masonite panel
Modeling paste
Colored bottles
Cathedral glass
Hammer
Newspapers - sacks
Palette or putty knife

1. Taking a hammer - carefully break the glass.

   Place bottles in several layers of grocery sack and rap several times with the hammer.

   Place the cathedral glass in between a thick layer of newspapers and rap sharply.

   (Beware of flying and shattering glass and splinters)

2. Arrange this cathedral glass into a composition.
3. Place modeling paste on the board and small area at a time with the palette knife.
4. Set the cathedral glass into this paste according to predetermined plan.
5. Sprinkle the crushed glass in paste while wet.
6. Continue until the whole board is covered.
7. Let dry - Shake off excess crushed glass into a large container.

#5. Broken glass mosaic

Poster board
Ducco Cement
Scraps of broken or cut cathedral glass
Glass cutter
Hammer
Newspaper

1. Break the cathedral glass as explained in #4 - #1, or use glass scraps which have been cut with a glass cutter.

2. Arrange the glass pieces into a composition on the board.

3. Glue to the board.

#6. Cut glass mosaic

Cathedral glass
Glass cutter
Poster board
Ducco Cement
Tile grout (see project #3

1. Work according to a pre-planned idea

2. Cut the cathedral glass into rectangular and square tiles of about 3/4 inch - 1 inch size.

3. Begin arranging these tiles according to your design - you may cut them into smaller and triangular shapes as you proceed.

4. When the design is completed, glue the glass onto the board. Let dry.

5. Rub the grout in between the tiles with the fingers.

6. Let dry 30 minutes and wipe off the excess with a damp rag.

PRESENTATION

Discuss the importance of plastic as related to past and present and stress safety factors. If you get tiles too hot you may have a fire. Watch carefully when heating. If tiles start smoking or giving off an odor. the temperature is too high. Work hot plastic with metal spatula and tweezers. The 1/2 inch square plastic tiles can be purchased at craft and hobby shops or from school suppliers. They are $3.00 for a package of about 200 tiles.

Textured sheet plastic can be purchased from school suppliers $1.50 - $2.50 for 12 x 24 sheet.

MATERIALS FOR ALL DESIGNS

Poly-Mosaic Tiles
Textured 1/8 plastic sheet
Broiler, oven or torch
Candle flame to modify tiles
Cookie sheet
Dupont Duco Cement
Tile Cutters

DIRECTIONS FOR ALL DESIGNS

Place tiles in design formation on cookie sheet with pieces touching to fuse tiles, preheat oven to 350 degrees.

At first, tile will seem to draw away from each other slightly then they will expand and join, rounding at the edges and becoming glossy. To reshape, soften edges or increase gloss, warm carefully over a sootless candle or torch flame. Mistakes can be heated and used again.

FISH ON TEXTURED SHEET

Fish designed formed on cookie sheet, design fused. Cool design. Glue design on textured sheet with Duco Cement. Glue textured sheet on to background wood sheet.

OPTICAL CHANGED ART

Place art work under textured 1/8 inch plastic sheet so that its optical look differs from the original work because of the textured plastic sheet over the top. The plastic sheet can be mounted right on the work or spaced away from the work. The plastic sheet spaced away from the art work will produce a different optical look than if it is placed right on the art work.